

A ROADMAP FOR REGULATORY SURVIVAL IN THE 1990s

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There have been many changes over the last several years in the ways that we're required to label, handle, and dispose of the products of our manufacturing processes...and we all know there will be more, not fewer, environmental regulations to deal with in the years to come.

Many of the easily solved environmental problems are gone. Those that remain are complex and sometimes global in nature: acid rain, the "greenhouse effect," stratospheric ozone depletion, atmospheric ozone increases, hazardous wastes, and abandoned waste sites.

These problems are manifestations of what some of us may call "environmental gridlock" -- when industry, government and the public feel overwhelmed by the tough decisions and actions that must still be taken -- and misunderstanding may get in the way of cooperative productive action to preserve the environment.

There is a way to break out of this gridlock, and to lay the groundwork for a future where both our businesses and our environment can survive and thrive. It demands that we not only comply with the regulations of today, but that we take the initiative in continuously improving our environmental performance.

Industry must keep abreast of and in compliance with the regulatory requirements that already exist and respond proactively with responsible manufacturing and disposal practices that will keep our business running profitably tomorrow.

This sounds like a tall order -- but it's based on the belief that no matter what kind of hazard a chemical presents, we in industry can help find ways to work with it safely from manufacturing through disposal. We must challenge ourselves to take the lead role in addressing safe handling and environmental issues, before we are forced to do so by law.

Understanding by to see how well we respond to that
watched over by the EPA and OSHA, among
TSCA, CERCLA, CAA, SARA, RCRA, and
there are requirements for premanufacturing
communications, and labeling. In addition, as our
to be aware of regulations in other countries.

How the requirements fit together, let's take a look at
-- a schematic view of some of the federal
and state regulations that impact our MSDS, labels, and overall compliance

How a chemical is listed by federal or state
For example, if a chemical has been listed by
the International Agency for Research on Cancer), or NTP (the National
Toxicology Program) as a carcinogen, this listing will trigger hazard communication
requirements on the levels of a chemical that you may
use in your plant wastes.

Whether a chemical is listed is the first critical step in overall
compliance. Being on one of these lists as a hazardous material or a
carcinogen may mean that MSD sheets may need to be changed in order
to comply with federal or state regulations. Being fully aware of how the chemicals
you use are listed by all pertinent bodies is the essential compass that you must have
to follow the regulatory road map. As an example of how the regulatory road map
works, let's look at a chemical which is listed by either IARC, NTP or OSHA and
follow its compliance requirements for MSDS, labels, and other state and federal
regulations.

And there are plenty of people who will help you with this
challenge. Our industry, for example, is working with
other governmental agencies. We follow all
MSDS requirements. In addition, through
notices, consent orders, hazard communication
regulations, and other state and federal
industry has become global, we must also

To better understand how all these
what we call a "Regulatory Road Map" of
federal and state regulations and state initiatives that impact
compliance requirements. (See Table 1)

It's important to be aware of all
regulations or recommending bodies. For example,
OSHA, IARC (International Agency for Research on
Cancer) as a carcinogen, will trigger hazard communication
requirements. It may also cause restrictions on
release into the air or water, as well as other

Understanding how a chemical is listed is the first critical step in overall
compliance. Once a chemical makes it onto one of these lists as a
carcinogen, your emissions, labeling, and other requirements
to comply with federal or state regulations. Being fully aware of how the chemicals
you use are listed by all pertinent bodies is the essential compass that you must have
to follow the regulatory road map. As an example of how the regulatory road map
works, let's look at a chemical which is listed by either IARC, NTP or OSHA and
follow its compliance requirements for MSDS, labels, and other state and federal
regulations.

Regulatory Road Map -- Federal Hazard Communication Requirements

The OSHA Hazard Communication Standard, 29 CFR 1910.1200, was promulgated in 1983 and went into effect on November 25, 1985. It initially required that chemical manufacturers and importers label shipping containers and provide Material Safety Data Sheets for all hazardous chemicals they manufacture.

In addition, if chemicals considered hazardous under OSHA are present at 1.0% or greater in a mixture, all of the hazardous effects reported for the component must be addressed on the MSDS unless the mixture as a whole has been tested. Carcinogens, as determined by OSHA, IARC or NTP, must be addressed on the MSDS if they are present at 0.1% or higher, again, unless the mixture containing the carcinogen has been tested and found not to be a carcinogenic. For example Methylene Dianiline (MDA) has recently been listed as a carcinogen by OSHA and therefore must be shown on MSD sheets to levels of 1,000 ppm or 0.1%.

The procedures and criteria used by OSHA, NTP, and IARC to classify carcinogens, vary somewhat. OSHA classifications result from the standard-setting process that the agency uses to regulate chemicals and presently includes Methylene Di Aniline, the others are listed on Table 2.

NTP has a two-pronged approach:

1) - "Substances or groups of substances, occupational exposures associated with a technological process, and medical treatments that are known to be carcinogenic," and

2) - those which may "reasonably be anticipated to be carcinogens," which are defined as "those for which there is a limited evidence of carcinogenicity in humans or sufficient evidence of carcinogenicity in experimental animals."

IARC has its own evaluation scheme.

Group I - Carcinogenic to humans, based on sufficient evidence of carcinogenicity in humans;

Group 2A - Probably carcinogenic to humans, based on limited evidence in humans and sufficient evidence in experimental animals;

Group 2B - Possibly carcinogenic to humans, based on limited human evidence in the absence of sufficient evidence in humans.

Group 3 - Materials are not classifiable as to carcinogenicity to humans.

Group 4 - Chemicals are considered probably not carcinogenic.

The carcinogen classifications determine whether or not a statement for carcinogenicity should appear on the label. OSHA has issued guidance for such determinations, as shown in Table 3.

As the Table shows, for chemicals regulated by OSHA, on the NTP list or categorized by IARC in Group 1 or 2A, a notation of carcinogenicity is expected to be on the label.

The OSHA Hazard Communication Standard also requires that other "chronic effects" be noted on the label, although the agency's guidance is not as clear as it is for carcinogenicity. Chronic hazards to be included on a label can be selected by a weight-of-evidence assessment. If the effect is "well-substantiated", then it should be noted on the label.

Of course, OSHA isn't the only agency on the regulatory road map. The Superfund Amendments and Reauthorization Act of 1986 ("SARA") was enacted into law in October 1986. Title III of SARA significantly impacts a manufacturing facility's legal requirement for hazard communication in the community in which it operates.

Sections 303 and 304 require that facilities cooperate in emergency planning and report releases of certain extremely hazardous substances to the community.

Section 311 of SARA Title III requires that the MSDSs for chemicals considered hazardous under OSHA Haz Com (or a listing of those chemicals) be provided to state and local emergency response organizations and to local fire departments.

Section 312 requires that for those chemicals, the facility submit an inventory form to the above agencies on an annual basis.

Section 313 covers a list of toxic chemicals initially derived from several state right-to-know lists. The law requires annual reporting of releases of these chemicals to EPA for the Toxic Release Inventory (TRI). A list of the Section 313 chemicals can be obtained from a EPA office.

In addition, a manufacturing or supplier must notify a customer of the fact that a chemical component in a mixture is on the 313 list. Such notification must be included with the MSDS, if an MSDS is required for a product.

As these regulations have evolved over the last eight years, the road map has become increasingly complex.

State Initiatives and Right-To-Know Laws

Some states have also taken a role in regulation. Right-to-know laws are now on the books in New Jersey and Pennsylvania, among others - and more states are likely to follow with various other requirements.

And although state laws are effective only for operations within that state, the logistics of assuring compliance can be complicated.

For example, the New Jersey statute covers workers and communities. It applies to any hazardous substances used, studied, produced, or handled at a facility in the state.

The law includes requirements for labeling and training. It also mandates environmental and workplace surveys by employers. Any person may request copies of the surveys, and employers must send copies to local police and fire departments.

The Pennsylvania state law requires labeling and MSD sheets for substances which the state has listed.

Manufacturers must prepare MSD sheets for each hazardous substance they produce or import, and must provide all purchasers with copies of the sheets for the hazardous substances purchased. MSD sheets are also made available to the public upon request.

New Jersey and Pennsylvania have Right-to-Know laws requiring that labels include statements of the presence of chemicals at various concentrations. Pennsylvania requires this type of information on the MSDS as well. Some products containing specific state listed chemicals may need to list these chemicals on labels/MSD Sheets at levels as low as 100 ppm. Of course, the state lists can be obtained by asking the state for this information.

Proposition 65

California's Proposition 65, the Safe Drinking Water and Toxic Enforcement Act of 1986, is a citizen initiative approved by 65 percent of state voters.

The law requires the governor to publish a list of chemicals "known to the state to cause cancer or reproductive toxicity." It establishes two prohibitions regarding use of the listed chemicals.

First, no person may knowingly discharge or release a listed chemical into drinking water or into or onto land where it will pass into a source of drinking water.

Second, no person may knowingly expose any individual to a listed chemical without first providing a "clear and reasonable warning" of significant risk to the individual if an assessment indicates a certain risk level. For carcinogens, the trigger is a risk of 10^4 i.e., in 1 in 10,000, as determined by the linearized multistage model for risk assessment.

For reproductive toxins, the trigger is the no-observed-effect-level divided by 1,000.

Warnings must then be provided for environmental, workplace, and, most significantly, consumer-product exposure of an individual to the state listed chemicals. If warnings are necessary they may be included on labels, MSD sheets or fax sheets. In addition, they may also be placed in the workplace or other areas to indicate to the public that there may be a warning necessary for that particular product which contains a state listed chemical.

The impact of other Initiatives

In addition to being aware of and in compliance with the federal and state regulations we've already discussed, industry also needs to be aware of how a chemical can be affected by the many branches within the EPA, particularly the offices of Air and Radiation and Solid Waste.

A primary focus in the Office of Air and Radiation is Clean Air Act implementation and ambient air quality. Also important is the Emissions Standards and Engineering Division, which develops standards to regulate air pollutants.

In addition to knowing how a chemical is regulated or listed by various EPA offices, we must also be aware of how a listed carcinogenic or hazardous chemical is regulated by the EPA.

If a particular chemical is listed by EPA as a hazardous waste, one must be aware of how it is to be disposed of properly. The identification of a chemical as a hazardous waste may also include process chemicals, by-products, or still bottoms that are listed under the Resource Conservation and Recovery Act or RCRA. The Waste Management Division in the office of Solid Waste, is seeking further ways for industry to reduce pollution through waste treatment, minimization or elimination, and recycling.

How to Survive

There is no question that concern for the environment has placed a significant responsibility on all of us. And while the costs of compliance are often high, the costs of non-compliance can be many times higher.

In order to survive, we must see ourselves and be seen by others as part of the solution, not part of the problem. That means we must voluntarily reduce emissions and waste further. This voluntary action will build our credibility and show lawmakers and the public that regulation isn't the only way to make progress in protecting our environment.

At Dow, we've been trying to do our part. In the last several years, we've significantly reduced both air and water emissions. For example, we've reduced our emissions to the air by 85 percent since the early 80's. Also, for many years, we've been committed to handling our non-water waste internally in state-of-the-art incineration facilities.

And in the last six years, we've invested over a billion dollars in capital alone to make environmental, health, and safety improvements in our plants around the world.

In addition to making real, measurable improvements, we must also all work harder to acknowledge the legitimacy of the public's concerns and to encourage greater public involvement in environmental policy making.

We should open our facilities for tours and invite visits from neighbors, elected officials, and special interest groups. By working together, we will lessen the misunderstandings, increase the level of communication, and demonstrate our willingness to cooperate and negotiate.

The third thing we can do is strengthen our participation in various trade and industry organizations, like SACMA and AIA, etc. This can help us achieve consistency in environmental and health and safety policy by promoting reasonable, scientifically based federal regulations and a more influential EPA and OSHA. Trade associations provide an opportunity for industry and government to work together on common issues. They can also help you better understand the regulations being addressed and how your company can achieve compliance at an early stage.

A good example of this kind of effort is Responsible Care®, a voluntary program being adopted by chemical companies in the U.S., Canada, Australia, New Zealand, the United Kingdom, and France. All participants agree to adhere to specific principles and management practices which require them to continuously improve their environmental, health, and safety performance in the areas of community awareness and emergency response, distribution and transportation safety, waste and release reduction, safe plant operations, worker safety, waster management, product stewardship, and more. By participating in Responsible®, the chemical industry is making a public commitment that their environmental performance will improve -- in ways that government and the public can measure. (See Table 4 for the guiding principle of Responsible Care®.

Ultimately, the answer to survival in the 1990s is awareness. Make use of the many resources available to keep abreast of how the chemicals you use are listed and what regulations you must comply with.

Make sure you know how the chemicals you use are listed by NTP, OSHA and IARC, as well as staying up to date on the requirements of the EPA and individual states.

A healthy environment and a healthy economy are both achievable goals. By responding proactively, working together, and communicating openly, we can help ensure that the 1990s are remembered as the decade of environmental progress throughout industry.

Please note: This paper is being presented in good faith, but is not intended as a substitute for legal advice. If you require legal advice, consult a legal professional who is well-informed as to the latest regulatory developments for the specific chemicals you use in your operations. Reference should also be made to primary legal sources to verify that the most recent developments are considered. The authors are not attorneys.

Occupational Safety And Health Standards

Subpart Z - Toxic and Hazardous Substances

| Sec. | Sec. |
|-----------|--|
| 1910.1001 | Asbestos, tremolite, anthophyllite, and actinolite. (eff. 7-21-86) |
| 1910.1002 | Coal tar pitch volatiles; interpretation of term. |
| 1910.1003 | 4-Nitrobiphenyl. |
| 1910.1004 | alpha-Naphthylamine. |
| 1910.1006 | Methyl chloromethyl ether. |
| 1910.1007 | 3,3-Dichlorobenzidine (and its salts). |
| 1910.1008 | bis-Chloromethyl ether. |
| 1910.1009 | beta-Naphthylamine. |
| 1910.1010 | Benzidine |
| 1910.1011 | 4-Aminodiphenyl. |
| 1910.1012 | Ethyleneimine. |
| 1910.1013 | beta-Propiolactone. |
| 1910.1014 | 2-Acetylaminofluorene. |
| 1910.1015 | 4-Dimethylaminoazobenzene. |
| 1910.1016 | N-Nitrosodimethylamine. |
| 1910.1017 | Vinyl chloride. |
| 1910.1018 | Inorganic arsenic. |
| 1910.1025 | Lead. |
| 1910.1028 | Benzene. |
| 1910.1029 | Coke oven emissions. |
| 1910.1043 | Cotton dust. |
| 1910.1044 | 1,2-dibromo-3-chloropropane |
| 1910.1045 | Acrylonitrile. |
| 1910.1047 | Ethylene oxide. |
| 1910.1048 | Formaldehyde. |

TABLE 2

Guidance For MSDS And Label Notations For Carcinogens

| <u>Source</u> | <u>MSDS</u> | <u>Label</u> |
|--|--------------|--|
| Regulated by OSHA as a carcinogen | X | X |
| Listed on NTP Carcinogen Report | X | X |
| IARC--Group 1 | X | X |
| IARC--Group 2A | X | X |
| IARC--Group 2B | X | Not Required |
| IARC--Group 3 | Not Required | Not Required |
| IARC--Group 4 | Not Required | Not Required |
| One Positive Study - Animal Only | X | Not Required |
| Multiple Animal Studies | X | Depends on weight of evidence; N.O. review needed. |
| One Positive Study - Some Human Evidence | X | X |

TABLE 3.3

Responsible Care[®] Guiding Principles

1. To recognize and respond to community concerns about chemicals and our operations.
2. To develop and produce chemicals that can be manufactured, transported, used and disposed of safely.
3. To make health, safety and environmental considerations a priority in our planning for all existing and new products and processes.
4. To report promptly to officials, employees, customers and the public, information on chemical-related health or environmental hazards and to recommend protective measures.
5. To counsel customers on the safe use, transportation and disposal of chemical products.

Responsible Care[®] Guiding Principles

6. To operate our plants and facilities in a manner that protects the environment and the health and safety of our employees and the public.
7. To extend knowledge by conducting or supporting research on the health, safety and environmental effects of our products, processes and waste materials.
8. To work with others to resolve problems created by past handling and disposal of hazardous substances.
9. To participate with government and others in creating responsible laws, regulations and standards to safeguard the community, workplace and environment.
10. To promote the principles and practices of Responsible Care[®] by sharing experiences and offering assistance to others who produce, handle, use, transport or dispose of chemicals.

